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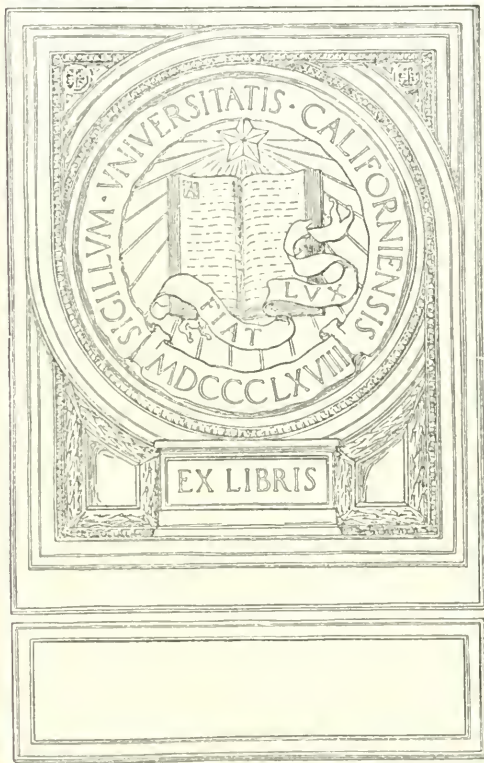


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On the Hours of Sleep at
Public Schools

By
T.D. Acland

UNIVERSITY OF CALIFORNIA
AT LOS ANGELES

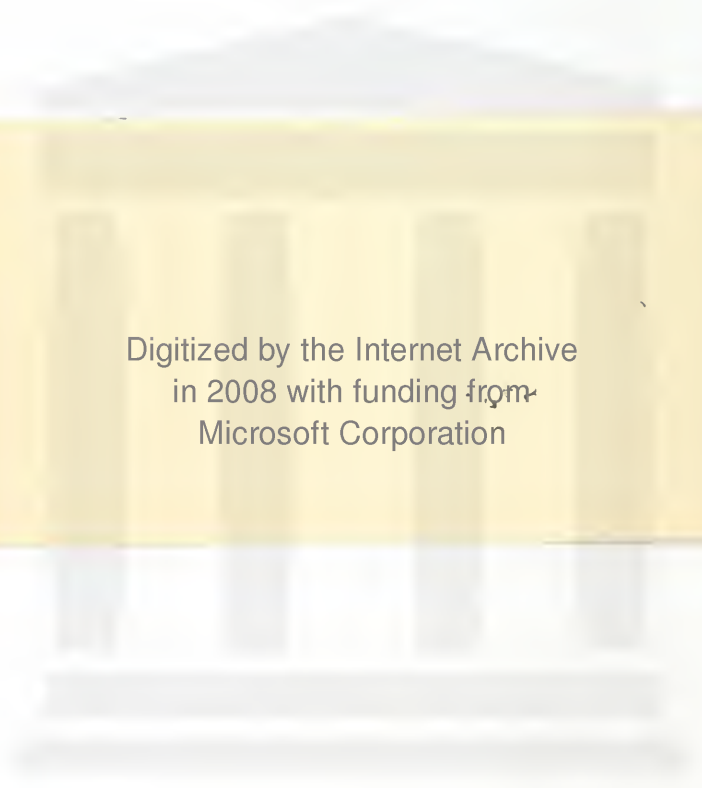


ERRATA.

ge 14, 8 lines from bottom, *for* "these cases," *read* "the cases."

ge 21, 5 lines from top, *for* "11 advocate," *read* "9 advocate."

ge 25, 6 lines from bottom, *for* "from $7\frac{3}{4}$ to $9\frac{1}{2}$ in summer," *read*
"from $10\frac{1}{2}$ in summer."



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Medical Officers' Association.

On the Hours of Sleep

AT

Public Schools

BASED ON AN INQUIRY INTO THE ARRANGEMENTS EXISTING IN FORTY OF THE GREAT PUBLIC SCHOOLS IN ENGLAND, AND OTHERS IN THE U.S.A.

18760

A PAPER READ BEFORE THE ASSOCIATION ON MAY 11, 1905,

BY

T. D. ACLAND, M.A., M.D.Oxon., F.R.C.P.

PHYSICIAN TO ST. THOMAS HOSPITAL, AND CONSULTING PHYSICIAN
TO THE HOSPITAL FOR DISEASES OF THE CHEST, BROMPTON.

London:

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On the Hours of Sleep at Public Schools

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It may possibly be asked why one who is not a Medical Officer to a great public school should take up the question as to the hours of sleep which are desirable for boys at school. The explanation is a simple one. My interest was excited by a particular case, and during the inquiries which ensued it seemed to me that it might be no bad thing for an outsider to introduce a discussion on this subject, especially, if like myself, he had no preconceived ideas and no traditions to influence him by casting an enticing and romantic haze over practices which belong to a bygone age, but which are in many ways opposed to the more enlightened views of modern hygiene.

There cannot be any question that sufficient sleep is a matter not only of importance but of vital necessity to the well-being of all young and growing children, especially at that period when the rapid unfolding of new bodily and intellectual functions makes it more than ever desirable that they should not be subjected to any influence which may retard or prevent the full development of their powers.

A physiological question such as the one under consideration, which involves more than a third part of a boy's life, is surely one on which the Medical Officers of Schools Association may be asked to express an opinion.

Judging by some of the correspondence which has lately appeared in the daily Press on the subject of our

Public Schools, there are still some persons who think that dirt, lack of cubic space, and insufficient food, are Spartan conditions which tend to promote hardihood and intelligence ; and that cleanliness, good food, ample ventilation, and common-sense regard for health encourage self-indulgence and coddling. Although, much has been done to improve the condition of our great schools during the last five and twenty years, it is within the knowledge of us all that there is still room for improvement, especially in matters relating to health.

My object to-day is to discuss with you the question as to the amount of sleep which it is desirable to give to the younger boys during the first two or three years of their life at a Public School, when they have not yet become acclimatised to their new conditions, and when they are subjected to pressure of various kinds, such as they have never before experienced, whilst at the same time they have reached a crisis in their lives which necessitates the most watchful care to enable them to attain to the maximum of intellectual and bodily efficiency.

Much is said about over-pressure in schools, and all of us must know of cases in which actual breakdown has occurred. I know of many, and my belief, which is shared by others who have ample opportunity for observation, is that a part, at any rate, of the harm is done by too little rest being given to the higher nerve centres owing to insufficient or broken sleep. Up to the time when this question first began to interest me I had assumed (as doubtless many have done before) that the hours of sleep in any great school were apportioned on some plan which had been carefully thought out between the medical advisers and the executive ; and it came to me as something of a surprise to find that in a school in which the Medical

Officer has for many years strenuously advocated the necessity for giving the boys up to sixteen years of age ten hours' sleep, a small boy of thirteen was placed in a dormitory in which the prefects' lights were not out and the dormitory was not quiet until 10.30, the boys being roused again at 6.15, giving in fact only $7\frac{3}{4}$ hours of quiet.

It is generally held that an average of about eight hours' sleep is good for adults after they have attained their full development, and during the best years of their active work. Some, of course, require less; some few require more. It is largely a matter of idiosyncrasy. There is much practical and some experimental evidence on this point. One distinguished member of our profession, a man of great physical strength, whose intellectual power was recognised by all who knew him, when under the full stress of work, often required, and took, ten. Another tells me he cannot do with less than eight and a half and another nine. Eight hours' sleep seems to be a reasonable average for an adult when engaged in active work. It is admitted by all, that the growing boy needs more sleep than the adult man. It cannot, therefore, be unreasonable to ask that boys who are just emerging out of childhood, when they are working and playing harder than ever before, should have fuller hours of sleep than those which might well be granted to a hard-worked man.

"Truth," as Ruskin says, "is not to be discerned by the uneducated senses." A clear perception of what is needed must depend upon previous knowledge and the exercise of trained observation. Those who have the care of growing boys ought not to be satisfied that long hours of work and strenuous play, combined with short hours of sleep, are desirable for them, without careful inquiry, nor without taking counsel with those who have the opportunity of looking a few years ahead, and who

are able to scan the horizon of the boy's future life after he shall have reached maturity.

I cannot doubt that the trained experience of the physician, who is able not only to watch the effect of school life upon the boy, but also to observe its after-effects, is a safer guide in the ultimate decision of all questions relating to health than that of the layman, who has not the technical knowledge and whose observation is mainly limited to the four or five years of the boy's Public School life.

The consequence of lack of repose to the body and central nervous system may entirely escape the notice even of a careful and experienced master.

I have been told that it is not noticeable that the younger boys suffer more from illness than the older ones, and that they do not show any ill effects from lack of rest. To an untrained observer nothing may appear to be wrong, whilst all the time the boy may be working under a strain to his nervous system, which, before many years have passed, may work out its nemesis in some neurosis, such as neurasthenia, chorea, or even epilepsy. We unfortunately know only too well that the first positive evidence of nerve strain may indicate damage, the effect of which will last through life.

"The mischief," an expert¹ writes to me, "is that the evil consequences . . . do not always show themselves at once, but are cumulative and come to the surface (often) after the boy has left school." I know of such cases, and there can be few here present who have not seen them; and which of us would like to apportion the blame with confidence between overwork,

¹ Sir James Crichton Browne, M.D., F.R.S., Lord Chancellor's Visitor in Lunacy, Writer of Report on "Overpressure in Elementary Schools," printed by the House of Commons; Vice-President of the Royal Institution, Great Britain.

under-sleep, or idiosyncrasy? Surely, if there is a possibility of risk, it is wiser to recognise it and not to subject the boy to any avoidable strain, which is as unnecessary as it is contrary to well-known physiological laws.

How fallacious deductions made from a limited point of view or with preconceived ideas may prove to be, is shown by the following statement of a lay correspondent, who writes: "What you and those who agitate with you for longer hours of sleep are doing is simply to encourage the luxury and self-indulgence which are eating the heart out of our English boyhood and manhood, and which show themselves nowhere more than in the matter of oversleeping." This is a serious statement, if it be true, and is deserving of full consideration. I shall refer to it again later, but as bearing upon the question I may mention that in four Schools in which both the master and medical officers give their opinion, in each case the master states that he does not think the smaller boys in that particular school need more sleep, whilst the medical officer is of opinion that they do!

To ascertain the facts as completely as possible I have, through the kindness of many correspondents (to whom I here tender my sincere thanks), obtained the approximate hours of quiet in the dormitories in forty of the great schools in England and in five of the largest and best schools in America¹ (Tables I. and II.), and I have obtained the opinions of a great number of observers in all parts of the country, especially of those who have written on the subject in standard works. I am thus enabled to lay before you a weighty mass of opinion, gathered from masters and medical officers of schools,

¹ A form of inquiry was sent to all the principal Public Schools in England, and in a large number of instances, where the information was not sufficiently exact, subsequent inquiries were made. I am under a deep debt of obligation to my many correspondents, some of whom I should like to mention by name, were it not, for obvious reasons, undesirable.

physiologists, and physicians. From all quarters comes the same reply: growing boys need nine to ten hours of sleep, the majority say *ten* (see Table IVa, p. 21) should be given to the younger boys (*e.g.*, from thirteen to sixteen), if the body and central nervous system are to be maintained at their maximum efficiency.

Here and there, but very rarely, a contrary opinion has been expressed, but in no case has any defence of short (*i.e.*, less than nine) hours of sleep been made by any medical officer of a school or physician. In the very few cases in which it has been made it has come from a layman, who can hardly be fully acquainted with the medical side of the question. The fact is that the unanimity of the replies I have received has caused me some surprise. There has practically been no dissent from the opinion that the younger boys require, and frequently do not get, sufficient rest.

If it were not that it seems to be unknown to some, and is not acted on by others who have charge of the boys in our great Public Schools, I should not venture to repeat the familiar message, but the facts as they exist must be faced.

TABLE I.

SHOWING THE APPROXIMATE HOURS OF UNDISTURBED REST
IN 40 ENGLISH PUBLIC SCHOOLS.

	YOUNGER BOYS.		OLDER BOYS.		Duration of Winter Hours.
	Summer.	Winter.	Summer.	Winter.	
1	10½	10½	8½	9½	{ Same all the year for juniors.
2	10	10¼	9¼	9½	
3	9¾	10¼	8¾	9¼	{ Two Winter terms, 24 weeks.
4	9¾	10	8¼	8½	
5	9¾	9¾	8¾	8¾	Not stated.
6	9¼	9¾	8½	8¾	About 8 weeks.
					Same all the year.
					Not stated.

TABLE I.—*Continued.*

	YOUNGER BOYS.		OLDER BOYS.		Duration of Winter Hours.
	Summer.	Winter.	Summer.	Winter.	
7	9 $\frac{1}{4}$	{ 10 hrs. } { 10 m. }	8 $\frac{1}{2}$	{ 9 hrs. } { 20 m. }	About 14 weeks.
8	9 $\frac{1}{4}$	9 $\frac{1}{2}$	9 $\frac{1}{4}$	9 $\frac{1}{2}$	Not stated.
9	9 $\frac{1}{4}$	9 $\frac{1}{4}$	8 $\frac{1}{2}$	8 $\frac{1}{2}$	Same all the year.
10	9 $\frac{1}{4}$	9 $\frac{1}{2}$	8 $\frac{3}{4}$	?	About 9 weeks.
11	9 $\frac{1}{4}$	9 $\frac{1}{4}$	9 $\frac{1}{4}$	9 $\frac{1}{4}$	Same all the year.
12	9	10	8	9	24 weeks.
13	9	10	8 $\frac{1}{2}$	9 $\frac{1}{2}$	About 8 weeks.
14	9	10	8 $\frac{1}{2}$	9 $\frac{1}{2}$	About 8 weeks.
15	9	9 $\frac{1}{2}$	9	9 $\frac{1}{2}$	24 weeks.
16	9	9 $\frac{1}{2}$	8 $\frac{1}{2}$	9	About 16 weeks.
17	9	9	8 $\frac{1}{2}$	8 $\frac{1}{2}$	Same all the year.
18	8 $\frac{3}{4}$	8 $\frac{3}{4}$	8	8	Same all the year.
19	{ 8 hrs. } { 40 m. }	9 $\frac{1}{2}$	{ 8 hrs. } { 40 m. }	9 $\frac{1}{2}$	24 weeks.
20	{ 8 hrs. } { 40 m. }	{ 8 hrs. } { 55 m. }	{ 8 hrs. } { 40 m. }	{ 8 hrs. } { 55 m. }	About 8 weeks.
21	8 $\frac{1}{2}$	9 $\frac{1}{2}$	8 $\frac{1}{2}$	9 $\frac{1}{2}$	24 weeks.
22	8 $\frac{1}{2}$	9 $\frac{1}{4}$	8 $\frac{1}{2}$	9 $\frac{1}{4}$	24 weeks.
23	8 $\frac{1}{2}$	9 $\frac{1}{4}$	8 $\frac{1}{2}$	9 $\frac{1}{4}$	24 weeks.
24	8 $\frac{1}{2}$	9 $\frac{1}{2}$	8	9	About 5 weeks.
25	{ 8 hrs. } { 25 m. }	9 $\frac{1}{4}$	{ 8 hrs. } { 25 m. }	9 $\frac{1}{4}$	About 10 weeks.
26	8 $\frac{1}{2}$	9 $\frac{1}{2}$	8 $\frac{1}{2}$	9 $\frac{1}{2}$	Not stated.
27	8 $\frac{1}{2}$	9	8	8 $\frac{1}{2}$	24 weeks.
28	8 $\frac{1}{2}$	9	7 $\frac{1}{2}$	8	About 8 weeks.
29	8 $\frac{1}{2}$	9	8 $\frac{1}{2}$	9	About 12 weeks.
30	8 $\frac{1}{2}$	9	8 $\frac{1}{2}$	9	About 6 weeks.
31	8 $\frac{1}{2}$	8 $\frac{3}{4}$	8 $\frac{1}{2}$	8 $\frac{3}{4}$	Not stated.
32	8 $\frac{1}{2}$	8 $\frac{1}{2}$	8	8	Same all the year.
33	8 $\frac{1}{2}$	8 $\frac{1}{2}$	8 $\frac{1}{2}$	8 $\frac{1}{2}$	Same all the year.
34	8 $\frac{1}{2}$	9 $\frac{1}{4}$	8 $\frac{1}{2}$	9 $\frac{1}{4}$	A few weeks only.
35	8 $\frac{1}{4}$	9	8 $\frac{1}{4}$	9	About 18 weeks.
36	8 $\frac{1}{4}$	9	—	—	24 weeks.
37	8 $\frac{1}{4}$	8 $\frac{3}{4}$	8 $\frac{1}{4}$	8 $\frac{3}{4}$	Not stated.
38	8 $\frac{1}{4}$	8 $\frac{1}{4}$	8 $\frac{1}{4}$	8 $\frac{1}{4}$	Same all the year.
39	8	9	8	9	A few weeks only.
40	7 $\frac{3}{4}$	8 $\frac{1}{4}$	7 $\frac{3}{4}$	8 $\frac{1}{4}$	For some weeks.

TABLE II. (A)

SHOWING THE HOURS OF SLEEP GIVEN IN *FIVE* OF THE
PRINCIPAL *AMERICAN SCHOOLS*.

	YOUNGER BOYS.	OLDER BOYS.
1.	10 and $9\frac{3}{4}$ according to age	$9\frac{1}{2}$, With form 9
2.	10 winter, $9\frac{1}{2}$ summer	$9\frac{1}{2}$ winter, 9 summer
3.	10 to $9\frac{1}{2}$ under 16 years	9 from 16 to 18 years
4.	$10\frac{1}{4}$ under 15 years	9 hrs. 20 min. over 15 years. With Form 8 hrs. 55 min.
5.	$10\frac{1}{2}$ to 9 according to age.	With Form $8\frac{1}{2}$

NOTE.—In none of the above Schools is there Chapel or School before breakfast at any time during the year.

TABLE II. (B)

SHOWING THE HOURS OF SLEEP GIVEN IN CERTAIN *TRAINING
SHIPS AND INSTITUTIONS*.

	Hours of Sleep.	Limit of Age.
Training Ship A ...	$8\frac{3}{4}$ to 9	Up to 16
„ „ B ...	9	„ 17
Royal Naval School ...	$9\frac{1}{4}$	„ $15\frac{1}{2}$
Reformatories ...	$8\frac{3}{4}$ to $9\frac{1}{4}$	„ 16

There are three main points to be considered : (1) The allowance of sleep which is reasonable for growing boys during the first two or three years of their life at a Public School ; (2) The risk which is incurred by stinting young growing boys of that amount of sleep for which Nature makes an imperative demand ; and (3) some of the difficulties in the way of obtaining the needful amount of sleep in many Public Schools.

I will ask you first to consider the question from the point of view of the physiologist.

Professor McKendrick¹ writes to me, "A young growing lad should have ten hours' sleep both during summer and winter.

"During the time they are at School and College there can be no doubt that the mental efficiency of boys is kept up to the normal standard by plenty of sleep. I have often noticed a jaded appearance when less sleep was obtained than, say, eight or nine hours, whilst the boy will be bright and alert if he has, say, ten hours. . . . I have known men, who were no longer boys, who still needed nine hours' sleep if they were to do effective work."

Another distinguished physiologist, Professor C. S. Sherrington,² writes to me at length, condemning the practice of attempting to run the young boy's life with the same allowance of sleep which he considers necessary for the full grown adult. He points out that the child's bodily life is run more expensively than the adult's. Since bulk increases as the cube, and surface as the square, the child has, relatively, far more body surface than the adult, and has in consequence to produce more body heat to maintain its temperature. This is proved by the fact that the average child gives out about 500 c.c. of CO_2 per kilo of body weight, as against 300 given out by the adult. "The combustion in the child is more active than when growth has ceased; and further, there is the additional drain caused by growth, and the characteristic restlessness of boyhood; from all of which points, which are incontrovertible, he deduces that solely on physiological grounds the body of the child demands a diurnal balance of repose much greater than that which is required in later

¹ Professor J. G. McKendrick, M.D., F.R.S., Professor of Physiology in the University of Glasgow, formerly Fullerian Professor of Physiology Royal Institution of Great Britain, and writer of the article on Sleep in the "Encyclopædia Britannica."

² Professor C. S. Sherrington, M.D., F.R.S., Holt Professor of Physiology, University of Liverpool, Chairman of the British Association Committee on School Hygiene.

life. In short, that boyhood wants longer sleep than does set manhood.

"During sleep the chemical processes of the body are reduced in the case of Co_2 output to one-fifth, so that the organism during sleep may be said to have its fires banked instead of being run under forced draught. But sleep is not only a respite from chemical change, it is a mechanical rest as well, which is especially of importance during the years of growth. *

"By insufficient rest the growth can be stunted and development retarded. The heart and respiratory mechanism require for their efficient working a diastole (or rest period) equal to their working hours.

"Most of a boy's growth in stature is done in bed, and there, mental and physiological recreation goes on most efficiently; without plenty of sleep the activity of the waking day is like a house built on sand—in constant danger of breaking down and giving way."

He concludes by saying, "I should put the length of rest in bed demanded 'by small boys,' *e.g.*, boys from 13 to 15 at 10 hours, and their normal hour for retiring at 9; and he adds, as is universally admitted, "the wants of all children are not the same—it is a question of idiosyncrasy."

Thus speaks the physiologist in no uncertain terms. In his opinion there are not two sides to this question.

I hear it objected, however, that this is all very well, but it is pure theory—the speaker has no practical experience of the education of boys and their actual needs. Far from this being the case, Professor Sherrington is not only a distinguished physiologist, but he is also the chairman of a Committee appointed by the British Association to report on the conditions of health essential to the carrying on of the work of instruction in Schools, and for some years he has given special attention to the subject.

If the words of the man of science cannot carry conviction, let the House Master in one of the most celebrated schools in England speak. He writes: "On the general principle of giving boys more sleep I am quite with you, and will support any reasonable proposal when made for reform." And, further, the Head Master of one of the best schools in America says: "You will see that we give the boys a good deal more sleep than they have in public schools in England. I was myself at Cheltenham College for five years, and I feel convinced that we were not allowed enough time for sleep. At this school boys up to 15 are allowed $10\frac{1}{4}$ hours; over 15, if not in the VIth, 9 hrs. 20 mins.; VIth form, 8 hrs. 55 mins." So that in this school more sleep is given to the VIth form boys than in many English schools is allowed to children of 13 and 14.

The Headmaster of another school (this time an Englishman), who was for 14 years Assistant Master at one of the great schools, where the hours of quiet in the dormitories are given as $8\frac{1}{4}$ and $8\frac{3}{4}$ in summer and winter respectively, writes to me: "As to sleep, the fact that I aim at 9 (hours) for myself will show you my belief on the subject. In the winter we have no work before breakfast. The bigger boys get $9\frac{1}{2}$ hours' sleep in the winter, for silence is enacted at 10 p.m. . . . The little boys are in bed at 9, are called at 7.30, and are down at 8, so they get $10\frac{1}{2}$."

To turn to the medical aspect of the case Dr. Clement Dukes, whose writings on School Hygiene are widely consulted by all educational authorities, in the address which he gave before the Congress on School Hygiene in February last (1905), said:—"If we follow nature, during the years of formation and development, adequate sleep must not only be permitted but enforced. When puberty arrives and new functions are being established

more sleep still is imperative, as is also the case in cold weather. The long hours of work demanded of the younger children, with the short time allowed for sleep, could not be continued if the scheme were in force all the year round, as there would be no children left at the school. The vacations save a complete breakdown." He concludes by saying: "It is both unwise and unnatural to arrange suitable hours of work and sleep for the seniors in schools, to which juniors have to conform with serious injury to their present and their future."

"According to Dr. Clouston there is a decreasing degree of staying power manifest during the last thirty years (*i.e.*, since the Education Act of 1870) on the part of the brain, to the extent of about 40 per cent. It is a question for us all to consider, what share, if any, schools have in this terrible fact with the excessive hours of work in the early years of childhood, and totally inadequate amount of sleep during the same period of life."¹

Dr. Hyslop, Senior Physician to Bethlem Royal Hospital and King Edward's Schools (London and Witley) is not less emphatic. "My experience in Bethlem," he says, "tells me that the question of sleep is worthy of our most serious attention. . . . 90 per cent. of these cases admitted to Bethlem since the year 1820 have suffered from insomnia.

"That one of the essentials of life (as sleep is) should be so prone to be disordered is significant that there is a fault in our economy, and this fault seems to arise from the fact that few, if any, of those who have charge of our boys and girls pay any attention to the cultivation of the *habit* of sleep."²

¹ Sleep in relation to Education by Clement Dukes, M.D., F.R.C.P., Physician to Rugby School, Author of "Health at School." Fourth edition, Rivingtons, 1905.

² During the discussion on this paper, Dr. G. H. Savage, Consulting Physician to Guy's Hospital, late Medical Superintendent of Bethlem Royal Hospital, spoke strongly to the same effect.

"The stress and strain of modern life necessitates increased brain activity, and in order that the mental energies may last, it is obvious that brain rest should be obtained.

"Insomnia, brain fatigue, neurasthenia are products of the last few decades, and nearly all the cases I have to deal with, have histories of overwork and inability to obtain a sufficient amount of rest. Oh! if only the people could be made to understand that the cultivation of the habit of sleep means an investment or insurance against the mental and nervous maladies of the present day. . . . Each decade sees us becoming more brainy, but the alertness of our youths and adolescents is shorter lived, and premature degenerations are the almost inevitable outcome of a false economy in the use and abuse of brain power. On several occasions I have spoken about the tendency to later hours and their train of evils, but the people will awaken themselves to the truth only when it is too late. . . .

"The increase in mental and nervous instability demands a reversal of the engines of education, and I would regard sleep as the best preservation against the stress and strain of life, and all the incidental conditions which make so many succumb in adult life. I have been some considerable time in making out a chart of the relationship of sleep to age; the reason for the various estimates are based upon deeper considerations than those of temporary expediency . . . (*See Chart, p. 33*). I have had charge of 480 children, 11 to 15 years of age, so I have had opportunities of studying the question."

I should like here to call attention to two papers by Dr. Hyslop, on "Mental Hygiene in Childhood,"¹ and "The National Basis of Education."² In these he points

¹ *Clinical Journal*, 1904, vol. xxv. No. 8, pp. 113-122.

² A Paper read before the Beckenham Medical Society, January 13, 1905, and shortly to be published.

out the evils of defective brain rest, and he draws attention to the symptoms of what he calls mental indigestion, such as nightmares, night terrors, somnambulism, epilepsy, and even convulsions, and he speaks strongly on the culpable ignorance of those who are responsible for the education of children, inasmuch as they attribute the formidable array of neuroses with which the expert has to deal merely to constitutional defect, whereas, in fact, it is to the system of education rather than to the child that the maladies are due. Ignorance on these points, he concludes, is all the more reprehensible, because it is within the power of those responsible, to obtain enlightenment from those who, having had the necessary medical training, are well qualified to advise them.

One of your members, himself the distinguished Medical Officer of a great Public School, writes :—
“The arrangements which still obtain in many schools under this head (the hours of sleep) are no doubt physiologically wrong and economically unsound.”

“It is obviously unreasonable that the child, who, if his parents are at all wise, is allowed his fair allowance of sleep within proper hours, during the holidays at home, should be docked of a substantial part of his physiological income just when the call upon it is greatest, that is at school.”

Next let me quote Sir James Crichton Browne, whose work on Overpressure in Schools is so well known. He writes : “You will be doing a public service by calling attention to the matter and by insisting on the importance of the *vis dormativa* in early years.” He adds that he has not the shadow of a doubt that obvious and immediate harm results from short hours of sleep, and is certain that much and very serious deferred harm may result from them. He continues : “Highly strung, sensitive boys suffer at once from loss of sleep.

... The more stolid and stable boys suffer covertly in slight retardation of brain growth and intelligence, not so obvious but real enough.

"Sleep is more intimately connected with brain growth than with brain function.

"In the years of highest cerebral activity in adult life, least sleep is required, in the years of low functional activity, but rapid growth, most. . . . I have noted as one of the causes of the physical deterioration that is, I believe, going on, insufficiency and dislocation of sleep.

"This is a sleepless age, and more and more . . . we are turning night into day.

"The sleep of the rising generation is being seriously interfered with, abbreviated and broken, and the inevitable consequence must be a rich crop of 'neurotism' and a general lowering of the level of intelligence."

These are strong words coming from a trained observer who has devoted more than thirty years to the study of disorders of the nervous system, and who has made a special study of the evil results of over-pressure in schools which has deservedly received wide recognition. Three and twenty years ago he wrote: "From birth, when the brain is growing rapidly and when life is almost a continuous sleep, onwards till manhood when brain growth is at an end, and when only a third of existence is (or ought to be) given to sleep, the increment of growth progressively diminishes, and *pari passu* with this diminution in growth goes a reduction in the demand for sleep made by the system, so it might perhaps be said that eight hours in the twenty-four constitute the amount of reparative sleep needed by the full grown brain, and that all sleep beyond that amount prior to maturity is germinal sleep connected with processes of growth and development."¹

¹ Education and the Nervous System. In the "Book of Health." Cassell and Co., pp. 293, 294.

If this is a reasonable statement of the case, it follows that to give the adolescent brain a bare eight hours' sleep is to stint the growing boy not only in the time needed for the processes of development and growth, but to impair the efficiency of those higher nerve centres on whose well-being the future of the boy's intellectual standard so largely depends. Nothing is more certain than that the improvement of the community turns upon the proper care and management of its children, and no temporary success in obtaining scholarships at the Universities and other distinctions, which are so often unreasonably accepted as the standard of efficiency of a school, can compensate in any way for the disregard of the plain teachings of physiology as to the relations of work and sleep, which must in the long run be obeyed if the mass of ordinary boys are to be turned out fitted, in the best way of which they are capable, for taking their places as citizens of a great empire. Dr. Welldon, formerly headmaster of Harrow, draws attention in one of his speeches to a fact which had impressed itself upon him, namely, the number of clever brilliant boys he had known who, in after life, had absolutely disappeared. As Dr. Dukes remarks, "he did not recognise that these boys' immature brain tissue was exhausted before manhood."¹

In these days when athletics count for so much at school, it is well to recognise that ample sleep is needed not only to render the brain and nervous system fit for active work, but that it is not less necessary to maintain the muscles of an active boy in good sound condition.²

¹ "Remedies for the Needless Injury to Children involved in the Present System of School Education." An Address delivered before the Incorporated Association of Headmasters at their Annual General Meeting held in London. Rivingtons, 1899, pp. 7, 8.

² I have received an interesting letter from Mr. C. B. Fry on this point. Although he was at a school where he got nine hours' sleep, he writes that he felt that he never had his sleep out, and required more than he got ; so much did he crave for sleep that often for the

Those who train men of picked physique for great races know this well, and insist (as one of the most celebrated oarsmen of our generation informs me) on a good $8\frac{1}{2}$ to 9 hours' sleep for those in training. These men, wise in their generation, do not see how much the crew can stand, nor run any avoidable risk of tiring them out before the final struggle has begun, a wisdom which it is to be feared is not always to be found in those who have the training of our youth for the great race of life.

TABLE III.

SYNOPSIS OF HOURS OF UNDISTURBED REST GIVEN TO THE YOUNGER BOYS IN *FORTY ENGLISH PUBLIC SCHOOLS*.

Class.	No. of Schools.	Ample Hours.	Moderate Hours.	Short Hours.
A.	5.	$9\frac{3}{4}$ to 10 or more all the year.		
B.	2.	$9\frac{1}{2}$ to 10 the two winter terms.	9 during the summer term.	
C.	7.	$9\frac{1}{2}$ to 10 <i>for a few weeks only</i> .	9 to $9\frac{1}{2}$ the chief part of the year.	
D.	3.		9 to $9\frac{1}{4}$ all the year.	
E.	7.		9 to $9\frac{1}{2}$ the two winter terms.	8 to $8\frac{1}{2}$ during the summer term.
F.	8.		9 to $9\frac{1}{2}$ <i>for a few weeks only</i> .	8 to $8\frac{1}{2}$ the chief part of the year.
G.	8.			8 to $8\frac{3}{4}$ or less all the year.

It is interesting to note that there appear to be only five out of the forty English schools which come up to the highest standard, whilst in all five of the great first week or so of the holidays he would go to bed about 10 p.m. and sleep till one or two o'clock and sometimes even till five o'clock the next day. He adds this was not laziness, but was absolutely a natural paying of himself back, he felt that he had lived on his capital.

American Schools with which I have been put into communication, through the kindness of Professor W. Osler,¹ the approved hours are given to the younger boys, namely, $9\frac{1}{2}$ to 10 ; and further, four of the headmasters of these schools have stated quite emphatically that these hours are desirable for the well-being of the boys.

Fifty medical experts, medical officers of schools and others, have expressed a decided opinion that ample hours of sleep are needful for growing boys.

Amongst these are included all in this country who (as far as I can ascertain) have written definitely in standard works on the question of Sleep : Sir James Crichton Browne, Dr. Clement Dukes, Professor Bradbury, Dr. Hyslop, Professor McKendrick, and Professor Sherrington, and besides these there are many whose names are honoured in English medicine and whose opinions cannot be disregarded on such a question as this. Such are Sir William Broadbent, Sir Thomas Barlow, Sir Lauder Brunton, Sir Dyce Duckworth, Professor Clifford Allbutt (Cambridge), Professor Osler (Oxford), Dr. Collier, Dr. Dickinson, Dr. Goodhart, Dr. Savage, Dr. Eustace Smith, besides fifteen Medical Officers of the most celebrated Public Schools in England. It would be impossible to enumerate all, but the list includes many who have made a special study of diseases of children, and disorders of the nervous system, as well as those who have specially considered the subject in relation to modern education.

Twenty-seven have given the number of hours which they consider best, the remainder do not definitely specify the number of hours but speak emphatically in more general terms.

¹ Professor W. Osler, M.D., D.Sc., F.R.S., Regius Professor of Medicine in the University of Oxford, Late Professor of Medicine Johns Hopkins University, Baltimore, U.S.A.

TABLE IV. (A).

SHOWING THE *HOURS OF SLEEP DESIRABLE FOR GROWING BOYS.*

27 Medical Officers of Schools and other Medical Experts advise the following hours :

9	11	advocate 10 hours or more.
8	„	9½ or 9½ to 10.
6	„	9 to 9½ or 9 to 10.
4	„	9 as “a minimum.”

Not a Single Medical Expert has advocated less than Nine Hours.

TABLE IV. (B).

SUMMARY OF OPINIONS RECEIVED FROM MEDICAL OFFICERS OF SCHOOLS.

- 15 are in favour of longer hours. All from schools which give short hours of sleep during all or part of the year.
- 13 consider the hours of sleep sufficient in their schools.
In 10 of these schools 9 hours or more are given throughout the year.
In 2 for part of the year.
In 1 only are short hours given throughout the year.
- 6 replies indefinite.
- 6 replies not received.

It may, I think, be rightly claimed that there is conclusive evidence to show that both on physiological and medical grounds ample hours of sleep are necessary for the best development of growing boys, and that up to sixteen, 9½ to 10 hours of undisturbed rest in bed in winter, and 9 to 9½ in summer, would be in no way excessive.

Do they in practice get this amount, and if they do not, do they feel the strain ?

The first question may without hesitation be answered in the negative, since although in a limited number of schools, some of the small boys may be in their dormitories for the length of time named, there is practically no possibility from one cause or another of their having anything like this amount of sleep. Hours

in dormitory do not, of course, represent hours of sleep, though from some of the replies I have received it would appear that they are reckoned as such.

Even the number of hours in bed often do not represent hours of sleep where the boys are in dormitories, unless order is really maintained, as it appears to be in some few schools with good discipline, and on the training ships. But in a good many dormitories, besides the talking and ragging which goes on, there are other serious disturbances of sleep, which efficiently break the rest of all but sound sleepers. Amongst these have to be reckoned not only the turning up of lights when the older boys come to bed (so that although the small boys may get to bed earlier, they have the light in their eyes until the older boys are settled); but also the practice of not having the dormitory reasonably darkened, a point which Sir William Gull considered to be of great importance. Thus the hours are curtailed by the daylight waking the boys long before it is time for them to rise, and the quality of the sleep obtained is, in the case of light sleepers, seriously interfered with.

It cannot be questioned that the quality of sleep is influenced by darkness; and that to ensure the most complete rest to the nervous system, it is necessary that sleep should not only be unbroken by noise, but also by the exclusion of strong light from the room. It is also important that dormitories and cubicles should be properly warmed and ventilated. Sir James Crichton Browne writes, "a certain degree of bodily comfort is essential to the good quality of sleep, and quality is almost as important as quantity."

These may seem trivial details, but they are worthy the attention of those who have the well being of young boys at heart. There are few blessings given to mankind greater than a capacity for good sound sleep; it makes work easier and more effective, and probably more than

anything else, enables the happy possessor of the faculty to meet the strains which he must encounter in the struggle for existence.

It is surely worth while, for those who have charge of the young, not only to give ample hours of sleep, but to see that, as far as possible, the arrangements are such as to ensure that the sleep is not disturbed, as it often is, by preventable or unnecessary causes.

Those who have given attention to the subject, know the importance of this. "Quality," writes Dr. Hyslop, "is as essential as quantity for the building up the preservative power of sleep." Dr. Savage also lays special stress on this point, and it was a favourite maxim of Sir James Paget's.

In few schools would it appear that any attempt is made to encourage the *habit* of getting proper sleep; in fact, it seems to be assumed that the less sleep a boy can do with the better it will be for him, and the harder he will become. Such an idea is, I believe, entirely fallacious. It is not much more difficult to educate a boy in good habits than in bad ones, and of the two there can be no kind of doubt, that the boy who has acquired the habit of sleeping well, will in the long run have greater staying power than he who has not learnt the need for giving his nervous system sufficient rest.

One of my correspondents writes, "Happy the man who in the days of his youth has contracted the habit of sound regular sleep. The Headmasters should really, I think, offer prizes to the best sleepers!"

From all sides I have learned that short hours of sleep *do* often press heavily on the younger boys, and are of no possible advantage to them. None are more emphatic on this point than the Masters of Private Schools, who keep in touch with the boys after they leave, and especially those who have sons of their own at the Public Schools from whom they hear the truth.



They are not quite so innocent as one of my correspondents, who told me that he did not believe the small boys wanted more sleep, because they never complained to the Headmaster ! In two great schools I am assured that boys are not infrequently taken into the sanatorium, not because they are ill, but because they are tired out.

One distinguished member of our profession, whom I can remember as a boy at the top of one of our great Public Schools, writes, "As to sleep, I fully agree with you that boys, especially young boys, do not get enough at school. A little boy can honestly sleep the clock round, and is all the better for 10 hours. I remember that my condition as a little boy at school was one of perpetual want of sleep. I used to go to sleep at all sorts of inconvenient moments through the day in consequence. Another thing is the disturbance of the sleep of little boys, by the elder boys coming to bed later. . . . That ought not to be."

As showing the importance of what has been written, I should like to emphasise the fact that 15 Medical Officers attached to 12 of the great schools, in which the hours of sleep possible for the younger boys are amongst the shortest (Table IV. B. p. 21), have expressed the opinion that longer hours of sleep are desirable.

I have been told by one of the few who have questioned the soundness of my contention, that it is clear that the younger boys do not want more sleep, because if they are sent to bed early they chatter instead of going to sleep. But that they *do* want more sleep is clear from the fact that they often have to be roused out of deep sleep next morning, and dress half asleep in silence (as I have been assured they often do) too weary to show any of that exuberance of spirits which is natural to the healthy boy. If it is a fact that small boys chatter as a rule when they have a chance

of going to sleep, it would only show that in this, as in other matters, they need education. If in other branches of the school curriculum, as in this question of sleep, the decision as to what was good for them were left entirely to the boys, the whole plan of education would, I fear, very speedily be dislocated. Is it not the duty of those responsible for the order in a house to see that, after a reasonable time for going to bed has been allowed, silence is really enforced?

It is difficult to ascertain the precise hours of sleep which can be obtained in any particular school, since local conditions vary, as for instance, in one house silence in the dormitories may be really enforced at a given hour, whilst in others no account may be taken of the fact that prefects keep a light, or elder boys cause a disturbance by going to bed long after the normal hour given as that at which the younger boys are settled. It is also clear that the hours of sleep, generally adopted at any particular school, can be modified by the House Masters to some extent. The compilation therefore of such a table as that given on pages 8 and 9 is one of peculiar difficulty, and the hours given must be taken to represent the general rule of the school, rather than as applicable to any particular house in that school.

I have given in Table I. the hours of sleep allotted to the older boys as well as to the younger ones, and it will be seen that they also are often too short.

The general results of my inquiry, after careful sifting of the evidence, reveal some curious facts. In the first place, the hours of quiet which appear to be given to boys from 13 to 15 or 16 seem to range from $7\frac{3}{4}$ to $9\frac{1}{2}$ in summer, and from $8\frac{1}{4}$ to $10\frac{1}{2}$ in winter.

Again, winter hours vary from a few weeks in some schools to 24 weeks, *i.e.*, the two winter terms, in others.

There is also a wide diversity in the hours at which the boys are called.

TABLE V. (A)
SHOWING *HOURS AT WHICH THE BOYS ARE CALLED IN FORTY*
ENGLISH PUBLIC SCHOOLS.

No. of Schools.	Hours at which boys are called.	
1.	6.0 summer term	6.45 two winter terms
3.	6.15 most of the year	6.45-7.0 for some weeks
3.	6.30 all the year	
9.	6.30 most of the year	6.45-7.30 for some weeks
6.	6.30 summer term	7.0-7.30 two winter terms.
1.	6.30, not stated whether any difference in winter	
1.	6.45 all the year	
3.	6.45 most of the year	7.0-7.30 for some weeks
1.	6.45 summer term	7.30 two winter terms
2.	7.0 all the year	
1.	7.0 most of the year	7.30 for some weeks
2.	7.0 summer term	7.15-7.30 two winter terms
3.	7.0, not stated whether any difference in winter	
2.	7.15 all the year	
1.	7.15, not stated whether any difference in winter	
1.	7.30 all the year	

TABLE V. (B)
SHOWING *HOURS AT WHICH BOYS ARE CALLED IN FIVE OF THE*
PRINCIPAL AMERICAN SCHOOLS.

No. of Schools.	Hours at which boys are called.	
1.	6.50 all the year	
3.	7.0 all the year	
1.	7.0 in summer	7.30 in winter

Some of those who are willing to admit that the hours given in the schools with which they are connected are too short, raise certain objections to increasing them. They point out that there is a difficulty in arranging different hours for boys of different ages. Such an objection cannot be regarded as a serious one, for after all what can be done, and is done satisfactorily in some schools, might also be done in others.

The statement to which I have already referred, "that longer hours of sleep would encourage the luxury and self-indulgence which are eating the heart out of our English boyhood and manhood," requires consideration. If it be true, every writer on the subject of sleep in this country, as far as I can trace them, is wrong, since I am unable to find any statement in writings on School Hygiene which justifies the giving of as little as 8 hours' quiet in the dormitories to the younger boys, or which gives any countenance to the belief that 9, 9½, or even 10 hours is either morally or physiologically bad.

Commenting on the statement just quoted, the Headmaster of a large school writes: "It is strange indeed to find any one so mistaken as to the causes of whatever may be wrong with the upbringing of our youth as to attribute it to over-sleep. One sympathises with him in his fight against a tendency to luxuriousness and general slackness" (as we all do) "but I apprehend that it is a poor weapon to defy nature. We must look elsewhere for the cause." Professor George Darwin, of Cambridge, writes to me on the subject as follows:—"If it is a question of giving up some hours in school, or giving up sleep, I say the former is immeasurably preferable. I ask further whether lack of due sleep is not responsible for much of the prevalent slackness in school, of which there is so much reason to complain." If it can be shown that 9 to 9½ hours of actual sleep

are a physiological necessity for the average boy, it can hardly be seriously maintained that it is encouraging sloth to give it. Might it not just as well be argued that to give wholesome and sufficient food is encouraging gluttony, a comforting doctrine to those who do not care to face a difficult problem, but hardly one which is likely to satisfy parents or the boys themselves.

It is an equally unsatisfactory argument that short hours of sleep are a process of selection and lead to the survival of the fittest. This pre-supposes that the fittest are those who happen to need the least sleep, an wholly fallacious argument, as we all know, since those who are the least affected by a scanty allowance of brain rest during their years of growth, are often the dull heavy boys, whilst the keen, sensitive, intelligent boys, are the ones to suffer. A Master of one of the large Public Schools, and one in which the hours of sleep are comparatively good, writes : "The hours of rest could profitably be somewhat lengthened. . . . I am inclined to think that specially in the case of the clever boys this increase of rest would increase the intellectual efficiency."

Again I have been told that to allow boys to lie in bed after the hour of 6.30, which seems specially hallowed by tradition, is to encourage them in habits of idleness. This entirely depends on the hour at which the boys can get to sleep. It is no use burning the candle at both ends. To give a new version of an old proverb :—

Late to bed and early to rise,
Is neither physiological nor wise.

I believe in boys getting up early after a sufficient number of hours of sleep, but not before ; to allow them in the summer, when they have more play as well as their full allowance of work, to get into the habit of going to bed late is not defensible. The Medical Officer

of a great school which stands comparatively high in this matter of sleep in consequence of the boys having separate rooms, calls attention to this, and says in summer he thinks the younger boys often do not get sufficient sleep; whilst another says that in his opinion "for a young boy not to be in bed till 10, and up at 6.30, is an unduly strained life."

There seems to be a strong feeling that the difficulties of getting the boys to bed early are well-nigh insuperable, and that the real solution of the difficulty is the abolition of school, or of chapel and school, before breakfast, even if not in summer, certainly during the two winter terms.

There is a considerable body of opinion in favour of this abolition of school or chapel before breakfast. Three eminent physicians who have had special opportunities for arriving at a sound conclusion, think the question ought to be faced, and from Medical Officers of seven of the most important schools I have received expressions of opinion that it would be better certainly during the cold weather, if not all the year round, to abandon this practice, which is of doubtful utility, and is open to many objections.

The Master whose letter I have just quoted says:—"I think this addition (to sleep) would be best made in the morning, as if sent to bed too early the boys would not go to sleep but be inclined to play and talk, and the net result in rest would probably be diminished rather than increased. Boys, however, sleep quite soundly till late in the morning."

The objection to giving boys a fuller allowance of sleep which needs most consideration is the moral one.

The Headmaster of one of the great schools which has produced many successful scholars, whilst admitting that many of the younger boys would be the better for more sleep than they get, urges this objection; he says that longer hours would give opportunities for

those evil habits which have to be guarded against, and which are so rightly dreaded in any community of boys. His argument is that if the boys are tired out when they go to bed and have to be roused from sleep in the morning, they will have less temptation to evil.

Such an argument I believe to be not only a libel on the average healthy-minded boy, but I cannot help thinking it to be unsound, for the reason that no one was ever made moral by being made feeble.

I cannot doubt that the only way to combat this evil is to make the boys healthy, active, and vigorous, and to deal with the danger straightforwardly from the manly point of view. I would not have touched on the question but that it has been definitely raised in the course of my inquiries and has to be faced.

I consulted Sir Constantine Holman on this point. He has, as many of you know, been Treasurer and on the Council of a large Public School for nearly half a century, and has had wide experience in dealing with this problem ; he tells me (and allows me to use his name) that physiologically it is quite certain that the younger growing boys need more sleep than those who have arrived at maturity, and that an average of 8 hours is needed for fully grown men in active work, whilst boys at the critical period of their development need more.

He says he considers it absurd to suppose that the mere giving of an ample allowance of sleep would in any way tend to promote immorality ; that as a matter of fact the difficulties arise at the commencement of the night, and not in the morning when the increase of sleep must be given if at all. He does not believe that with all the opportunities for evil (if the boys are so minded) the question whether they have a sufficient or insufficient amount of sleep, can have any bearing whatever on the subject.

This is, I believe, the common-sense view of a difficult problem ; the danger cannot be avoided by aiming at weakness and repression, but only by healthy teaching and inculcating self-control.

There are two other points which I must briefly mention. One is that boys are classified not by age but by place in school, so that the clever little boys, who really require longer rest than others of their age, owing to the increased activity of their brains, get the shorter hours allotted to the older boys.

The other is that the line between juniors and seniors seems generally to be drawn between 15 and 16, instead of a year later. Boys up to 16 are still growing, and developing rapidly, and need all the rest given to younger boys.

I think that I may rightly claim to have shown that in many of our schools this question of sleep has been too little considered, and that the hours of sleep given to the younger boys, and I might almost say often to all the boys, are too short ; whilst in others, although the needs of the younger boys have been recognised to some extent, the attempts to give them longer rest than the older ones, by sending them to bed earlier in the same dormitories, have failed for various reasons. I have tried to face the difficulties and answer the objections to giving longer hours of sleep, and to show that physiology, medicine, and common sense declare in no uncertain voice, that to maintain the maximum intellectual and bodily efficiency of growing boys, it is absolutely necessary not to stint their bodies and their nervous systems of rest.

It seems to me that the logical conclusion is that younger boys should be placed in separate dormitories, under effective supervision, or if, as some believe, it is better to have boys of different ages in the same

dormitories, that quiet should be ensured for all, say at 10 p.m., and that during the summer months boys should be called at 7 and during the two winter months at 7.30. By this means 9 to 9½ hours of quiet could with reasonable certainty be obtained.

It may be urged that I am treading on dangerous ground, some may think that an attempt is being made to upset time-honoured traditions. To this I would reply that traditions based upon circumstances of life which have passed away, are not necessarily the best guides for dealing with the conditions of to-day, and that to respect traditions solely because they have been approved in the past makes not for national efficiency but for national decay.

The hurry and stress of life in the present day are infinitely greater than they have ever been before, and the alarming increase in disorders of the nervous system is attracting the anxious consideration of those who have the best opportunities of estimating its extent.

With these facts before us, we ought to spare no pains to impress our convictions as to the necessity for carefully regulated hours of rest, upon those who are responsible for the health and education of our boys on whose intellectual efficiency and bodily vigour the future of this country so largely depends.

In conclusion, I venture to hope that this Association may take the matter up, and may be able to convince those who have the direction of our great schools that the subject of giving the younger boys ample sleep is one which is deserving of their most serious consideration.

NOTE TO CHART.

This Chart has been compiled from figures given by Sir J. Crichton Browne (Health and the Nervous System, Cassell's "Book of Health," p. 296); Dr. Clement Dukes ("Health at School," Fourth edition, Rivingtons, 1905, p. 130); Professor A. Key¹ ("Handbuch der Schulhygiene Burgerstein und Nctolitzky," II^{te}. Aufl: Jena, 1902, p. 692); from an unpublished diagram by Dr. Hyslop; and from data obtained from the various Public Schools (*cf.* Tables I. and II.). In *twenty-three* out of the forty English schools of which I have obtained particulars, the hours of sleep given to the younger boys fall short of the *minimum* for all or part of the year, and even the hours given to the older boys are in many instances insufficient.

¹ Professor Key allows one hour in the dormitory for rising and going to bed in *addition* to the hours given in his table.

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